

REMARKS

Claims 12-25 are pending in this application. By this Preliminary Amendment, Applicant AMENDS the specification and the abstract of the disclosure, CANCELS claims 1-11 and ADDS new claims 12-25.

Applicant has attached hereto a Substitute Specification in order to make corrections of minor informalities contained in the originally filed specification. Applicant's undersigned representative hereby declares and states that the Substitute Specification filed concurrently herewith does not add any new matter whatsoever to the above-identified patent application. Accordingly, entry and consideration of the Substitute Specification are respectfully requested.

The changes to the specification have been made to correct minor informalities to facilitate examination of the present application.

Applicant respectfully submits that this application is in condition for allowance. Favorable consideration and prompt allowance are respectfully solicited.

Respectfully submitted,

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DESCRIPTION

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TELEPHONE INTERPRETATION ASSISTANCE DEVICE AND TELEPHONE

5 INTERPRETATION SYSTEM USING THE SAME

~~TECHNICAL FIELD~~

BACKGROUND OF THE INVENTION

1. Field of the Invention

10 The present invention relates to a telephone
interpretation assistance device ~~to be used for the sake of~~
interpretation services by phone when persons who speak
different languages meet each other, and a telephone
interpretation system for providing interpretation services by
15 using the same. In particular, the present invention relates
to a telephone interpretation assistance device ~~suited to for~~
holding conversations with foreigners who speak different
languages, such as on overseas trips and at overseas business
occasions, and a telephone interpretation system using the
20 same.

~~BACKGROUND ART~~ 2. Description of the Related Art

Among conventional interpretation systems for providing
telephone-based interpretation services at meetings ~~of with~~

persons who speak different languages are ones disclosed in Japanese Patent Laid-Open Publications No. H10-32893 and No. 2002-73783, for example.

In ~~these~~these systems, branch type microphones or
5 earphone-microphones ~~of branch type~~ are plugged into a voice input jack of the telephone terminal of a person to be interpreted (hereinafter, referred to as interpretee). One ~~and the other~~ branch of the microphones ~~are~~is worn by the interpretee and the other branch worn by his/her conversation
10 partner when an interpretation center is called from the telephone terminal ~~so~~such that the interpretee, the conversation partner, and the interpreter in the interpretation center can ~~hold~~conduct a three-party talk. As a result, the interpreter in the interpretation center ~~can~~
15 ~~listen~~listens to the speeches of the interpretee and the conversation partner, and the interpretee and the conversation partner ~~can~~ listen to the voice of the interpreter. Thus, when the interpreter listens to the speech of the interpretee and interprets it into the language of the conversation partner,
20 and listens to the speech of the conversation partner and interprets it into the language of the interpretee, the interpretee and the conversation partner who speak different languages can ~~hold~~conduct a conversation.

To use such interpretation services on overseas trips and
25 at overseas business occasions, the interpretee preferably

carries a cellular phone and branch-type headsets connectable to the voice input jack of the cellular phone. When interpretation is ~~needed~~required, an interpretation center is called for interpretation services. In this case, the
5 interpretor can call, from the cellular phone, an interpretation center in his/her own country and receive interpretation services. Moreover, if interpretation centers are provided in various countries and made available in respective national languages, the interpretor can also call
10 an interpretation center in that destination and receive interpretation services. It is understood that the interpretor can use the interpretation services when he/she meets a foreigner in his/her own country.

In such conventional interpretation systems, however, the
15 voice of the interpreter is transmitted to both the interpretor and the conversation partner. There has thus been the problem that when the interpreter interprets the speech of a speaker simultaneously, the voice of the interpreter ~~can~~
~~even reach~~reaches the speaker and ~~interrupt~~interrupts the
20 speech. In particular, conversations might be mixed up when the conversations ~~deal with common topics not related to the~~
~~languages, or contain addresses and the~~ likewords that can be
understood without particular interpretation or appeal to the other ~~parties~~party.

25 For this reason, in the conventional interpretation

systems, the interpreter ~~awaits~~waits for the completion of the ~~speech~~speaking of the interpretee before interpretation. The conversation partner then ~~awaits~~waits for the completion of the interpretation by the interpreter before
5 ~~speech~~speaking. The interpreter ~~awaits~~waits for the completion of the speech of the conversation partner before interpretation. Since such a procedure must be repeated, it has been difficult to conduct quick and precise interpretation.

~~It is thus a chief object~~

10

SUMMARY OF THE INVENTION

To overcome the problems described above, preferred
embodiments of the present invention ~~to make~~make it possible, in telephone interpretation when persons who speak different languages meet each other, that an interpreter interprets the
15 speech of a speaker in progress simultaneously without interrupting the speech of the speaker or mixing up the conversation, thereby allowing quick and precise interpretation.

20

~~DISCLOSURE OF THE INVENTION~~

A telephone interpretation assistance device according to ~~claim 1 comprises a~~ preferred embodiment of the present
invention includes headset connection jacks to which headsets to be used by an interpretee and a conversation partner who
25 speak different languages are connected, ~~respectively, a~~

telephone connection jack to which a telephone terminal for
~~holding~~ conducting a call with an interpreter is connected₇,
synthesis means for synthesizing voice signals input from the
respective headset connection jacks, and outputting the
5 resultant to the telephone connection jack₇, detection means
for detecting a switch signal from a voice signal input from
the telephone connection jack₇, and switching means for
outputting the voice signal input from the telephone
connection jack to a designated one of the headset connection
10 jacks based on the switch signal detected by the detection
means.

Consequently, the voice of the interpreter is transmitted
by the switching means to either one of the interpretee and
the conversation partner which is designated by the
15 interpreter from his/her terminal. Thus, the interpreter can
conduct simultaneous interpretation while a speaker is
speaking, without interrupting the speech of the speaker or
mixing up the conversation. This ~~allows~~ enables quick and
precise interpretation.

20 ~~— A telephone interpretation assistance device according to~~
~~claim 2 is the~~ The telephone interpretation assistance
device according to ~~claim 1, wherein the~~ this preferred
embodiment preferably includes synthesis means to perform
multiplexing of the voice of the interpretee and the voice of
25 the conversation partner.

Consequently, when the interpreter terminal has aan audio demultiplexing function, the interpreter can listen to the voice of the interpretee and the voice of the conversation partner separately, and can recognize the targets of interpretation clearly. It is therefore possible to avoid a mix-up in conversation, thereby ~~allowing~~enabling quicker and more precise interpretation.

~~A~~The telephone interpretation system according to ~~claim 3~~ ~~is one for providing a telephone interpretation service by~~ ~~using the telephone interpretation assistance device according to claim 1 or 2, comprising~~ this preferred embodiment preferably includes connecting means for connecting an interpretee terminal and an interpreter terminal₇, and communication means for conducting voice communications between the terminals connected by the connecting means. The connecting means ~~has~~includes an interpreter registration table ~~containing~~including at least the language types ~~possible for~~ interpreters to interpret and terminal numbers of the interpreters. The telephone interpretation system ~~has~~includes functions of: accepting a call from the interpretee terminal₇, acquiring the language type of the interpretee and the language type of the conversation partner from the interpretee terminal ~~offor~~ for which the call is accepted₇, extracting the terminal number of an interpreter by referencing the interpreter registration table based on the language type of

the interpretee and the language type of the conversation partner acquired₇, and calling the interpreter terminal by using the extracted terminal number of the interpreter.

Consequently, the terminal number of the interpreter who
5 can interpret the language of the interpretee and the language of the conversation partner is extracted from the interpreter registration table based on the call from the interpretee terminal. Then, the interpretee terminal and the interpreter terminal are connected automatically. The interpretee can thus
10 receive telephone interpretation services easily by using the telephone interpretation assistance device and calling the interpretation center.

~~A telephone interpretation system according to claim 4~~
~~is~~In the telephone interpretation system according to claim 3,
15 ~~wherein~~this preferred embodiment, the communication means haspreferably includes functions of: recording the voice from the interpretee terminal and the voice from the interpreter terminal₇, and reproducing and transmitting the recorded voices by request from the terminals.

20 Consequently, the voices of the interpretee, the conversation partner, and the interpreter are recorded during interpretation services, and the recorded contents can be ~~checked~~reviewed by request from the terminals. It is therefore possible to ~~check again what~~review anything that was unclear
25 at the scene, and examine the details of the interpretation

services later.

For voice recording, the voice to be transmitted to the
interpretee terminal and the voice to be transmitted to the
interpreter terminal may be recorded in ~~an~~a voice

5 multiplexing ~~fashion~~manner. Consequently, in terminals having
~~an~~a voice demultiplexing function, the voice transmitted to
the interpretee terminal and the voice transmitted to the
interpreter terminal can be ~~checked~~ separately reviewed for
~~the contents~~content.

10 The telephone interpretation system ~~may~~preferably also
~~comprise~~includes separation means for separating the voice
signal input from the interpretee terminal into the voice of
the interpretee and the voice of the conversation partner₁,
detection means for detecting the switch signal from the voice
15 signal input from the interpreter terminal₁, and switching
means for switching the destination of the voice signal input
from the interpreter terminal between the interpretee and the
conversation partner based on the switch signal detected by
the detection means. Here, the voice of the interpretee
20 synthesized with the voice ~~bound for~~transmitted to the
interpretee and the voice of the conversation partner
synthesized with the voice ~~bound for~~transmitted to the
conversation partner may be recorded separately. The telephone
interpretation system then reproduces and transmits the voice
25 ~~of a side~~ designated by ~~an~~a command from a terminal.

Consequently, even in terminals not having ~~the~~a voice demultiplexing function, the language of the interpretee and the language of the conversation partner can be ~~checked~~ separately ~~for the contents~~reviewed for content.

5 A telephone interpretation assistance device ~~according to claim 5 is one for~~ conducting telephone interpretation with bidirectional simultaneous interpretation, ~~comprising~~according to another preferred embodiment of the present invention includes an interpretee telephone interpretation
10 assistance device and an interpreter telephone interpretation assistance device. The interpretee telephone interpretation assistance device ~~comprises~~includes an interpretee headset connection jack to which a headset to be used by an
15 interpretee is connected₇, a conversation partner headset connection jack to which a headset to be used by a conversation partner is connected₇, a telephone connection jack to which a telephone terminal for ~~holding~~conducting a call with an interpreter is connected₇, synthesis means for multiplexing a voice signal input from the interpretee headset
20 connection jack as the first channel and a voice signal input from the conversation partner headset connection jack as the second channel, and outputting the resultant to the telephone connection jack₇, and separation means for demultiplexing a voice signal input from the telephone connection jack, and
25 outputting the first channel of the resultant to the

interpretee headset connection jack and the second signal of the resultant to the conversation partner headset connection jack. The interpreter telephone interpretation assistance device ~~comprises~~includes a first interpreter headset

5 connection jack to which a headset to be used by a first interpreter who interprets the language of the conversation partner into the language of the interpretee is connected, a second interpreter headset connection jack to which a headset to be used by a second interpreter who interprets the language
10 of the interpretee into the language of the conversation partner is connected, a telephone connection jack to which a telephone terminal for ~~holding~~conducting a call with the interpretee is connected, separation means for demultiplexing a voice signal input from the telephone connection jack, and
15 outputting the first channel of the resultant to the second interpreter headset connection jack and the second channel of the resultant to the first interpreter headset connection jack, and synthesis means for multiplexing a voice signal input from the first interpreter headset connection jack as
20 the first channel and a voice signal input from the second interpreter headset connection jack as the second channel, and outputting the resultant to the telephone connection jack.

Consequently, the voice input from the headset of the interpretee is output to the headset of the second interpreter.
25 The voice input from the headset of the second interpreter is

output to the headset of the conversation partner. The voice input from the headset of the conversation partner is output to the headset of the first interpreter. The voice input from the headset of the first interpreter is output to the headset of the interpretee. As a result, the voice of the first interpreter is transmitted only to the interpretee, the voice of the second interpreter is transmitted only to the conversation partner, the voice of the conversation partner is transmitted only to the first interpreter, and the voice of the interpretee is transmitted only to the second interpreter. The interpreters can thus conduct simultaneous interpretation while the speakers are speaking, without interrupting the speeches of the speakers or mixing up the conversation. This ~~allows~~enables quick and precise conversation with bidirectional simultaneous interpretation.

A telephone interpretation system ~~according to claim 6 is one~~ for providing a bidirectional telephone interpretation service by using a caller-side telephone interpretation assistance device ~~comprising~~according to another preferred embodiment of the present invention includes an interpretee headset connection jack to which a headset to be used by an interpretee is connected, a conversation partner headset connection jack to which a headset to be used by a conversation partner is connected, a telephone connection jack to which a telephone terminal for ~~holding~~conducting a

call with an interpreter is connected^{7,1}, synthesis ~~man~~means
for multiplexing a voice signal input from the interpretee
headset connection jack as the first channel and a voice
signal input from the conversation partner headset connection
5 jack as the second channel, and outputting the resultant to
the telephone connection jack^{7,1} and separation means for
demultiplexing a voice signal input from the telephone
connection jack, and outputting the first channel of the
resultant to the interpretee headset connection jack and the
10 second channel of the resultant to conversation partner
headset connection jack. The telephone interpretation system
~~comprises~~includes connecting means for establishing
connection among an interpretee terminal, a first interpreter
terminal to be used by a first interpreter who interprets the
15 language of the conversation partner into the language of the
interpretee, and a second interpreter terminal to be used by a
second interpreter who interprets the language of the
interpretee into the language of the conversation partner^{7,1}
and communication means for conducting voice communications
20 among the terminals connected by the connecting means. The
communication means has a separation function for
demultiplexing a voice signal from the interpretee terminal,
and transmitting the first channel of the resultant to the
second interpreter terminal and the second channel of the
25 resultant to the first interpreter terminal, and a synthesis

function of multiplexing a voice signal from the first interpreter terminal as the first channel and a voice signal from the second interpreter terminal as a second channel, and transmitting the resultant to the interpretee terminal.

5 Consequently, the voice input from the headset of the interpretee is output to the second interpreter terminal. The voice input from the headset of the conversation partner is output to the first interpreter terminal. The voice input from the first interpreter terminal is output to the headset of the
10 interpretee. The voice input from the second interpreter terminal is output to the headset of the conversation partner. As a result, the voice of the first interpreter is transmitted only to the interpretee, the voice of the second interpreter is transmitted only to the conversation partner, the voice of
15 the conversation partner is transmitted only to the first interpreter, and the voice of the interpretee is transmitted only to the second interpreter. The interpreters can thus conduct simultaneous interpretation while the speakers are speaking, without interrupting the speeches of the speakers or
20 mixing up the conversation. This ~~allows~~enables quick and precise conversation with bidirectional simultaneous interpretation.

~~A telephone interpretation system according to claim 7~~
~~is~~In the telephone interpretation system according to ~~claim 6,~~
25 ~~wherein~~this preferred embodiment, the connecting means

~~has~~preferably includes an interpreter registration table
~~containing~~including at least the language types ~~possible~~ for
interpreters to interpret and terminal numbers of the
interpreters. The telephone interpretation system ~~has~~includes
5 functions of: accepting a call from the interpretee terminal_{T₁},
acquiring the language type of the interpretee and the
language type of the conversation partner from the interpretee
terminal of which the call is accepted_{T₁}, extracting the
terminal number of the first interpreter by referencing the
10 interpreter registration table based on the language type of
the conversation partner and the language type of the
interpretee acquired_{T₁}, calling the first interpreter terminal
by using the extracted terminal number of the first
interpreter_{T₁}, extracting the terminal number of the second
15 interpreter by referencing the interpreter registration table
based on the language type of the interpretee and the language
type of the conversation partner acquired_{T₁}, and calling the
second interpreter terminal by using the extracted terminal
number of the second interpreter.

20 Consequently, based on a call from the interpretee
terminal, the terminal numbers of the first interpreter who
interprets the language of the conversation partner into the
language of the interpretee and the second interpreter who
interprets the language of the interpretee into the language
25 of the conversation partner are extracted from the interpreter

registration table. Then, the interpretee terminal, the first interpreter terminal, and the second interpreter terminal are connected automatically. The interpretee can thus receive the telephone interpretation services with bidirectional simultaneous interpretation easily by using the telephone interpretation assistance device and calling the interpretation center.

~~A telephone interpretation system according to claim 8 is~~
In the telephone interpretation system according to ~~claim 6 or 7,~~ wherein this preferred embodiment, the communication means ~~has~~ preferably includes functions of: recording the voice from the interpretee terminal, the voice from the first interpreter terminal, and the voice from the second interpreter terminal, and reproducing and transmitting the recorded voices by request from the terminals.

Consequently, the voices of the interpretee, the conversation partner, the first interpreter, and the second interpreter are recorded during interpretation services, and the recorded contents ~~can be checked~~ are reviewed by request from the terminals. It is therefore possible to ~~check again~~ review at a later time what was unclear at the scene, and to examine the details of the interpretation services later.

~~A telephone interpretation system according to claim 9 is~~
In the telephone interpretation system according to ~~any one of claims 3, 4, 7, and 8,~~ wherein this preferred embodiment,

the interpreter registration table ~~contains~~preferably includes selection information for selecting interpreters⁷, and the connecting means ~~has~~preferably includes functions of acquiring an interpreter selection condition from the interpretee terminal, and extracting the terminal number of an appropriate interpreter by referencing the interpreter registration table based on the interpreter selection condition acquired.

This makes it possible to select an interpreter that is suited ~~to~~for the purpose of the meeting between the interpretee and the conversation partner, out of those who are registered in the interpreter registration table. The selection information for selecting interpreters includes information ~~on~~regarding gender, age, residence, ~~the~~ fields of specialization, qualifications, ~~etc~~and other useful information.

If the interpreter registration table ~~contains~~includes the language-specific interpretation levels of the interpreters, users can select interpreters ~~of levels at~~ desirable levels for interpretation between intended languages. Meanwhile, the interpreters can register for a number of languages that they speak. This ~~allows~~enables flexible, efficient selection of interpreters.

For the telephone interpretation system with bidirectional simultaneous interpretation, the levels of listening comprehension and those of speaking abilities may be

registered separately as the language-specific interpretation levels in the interpreter registration table. This makes it possible to select persons ~~the~~ that are most suitable for the first interpreter and the second interpreter individually,
5 ~~allowing~~ enabling more flexible efficient selection of interpreters.

~~A telephone interpretation system according to claim 10 is~~
10 ~~In the telephone interpretation system according to any one of claims 3, 4, 7, 8, and 9, wherein:~~ this preferred embodiment,
the interpreter registration table ~~contains~~ preferably includes availability flags for indicating whether or not the interpreters are available, and the connecting means ~~has~~ includes a function of extracting the terminal number of an available interpreter by referencing the availability flags in
15 the interpreter registration table.

The interpreters can thus register their availabilities into the interpreter registration table ~~so~~ such that available interpreters are automatically selected and called. This ~~can~~ preclude precludes needless calls, and ~~provide~~ provides more
20 flexible and efficient telephone interpretation services.

~~A telephone interpretation system according to claim 11 is~~
25 ~~In the telephone interpretation system according to any one of claims 3, 4, 7, 8, 9, and 10, wherein:~~ this preferred embodiment, the interpreter registration table ~~has~~ preferably includes a function of registering accounting information on

the interpreters⁷, and the connecting means ~~has~~includes functions of measuring the time for the interpretee terminal to receive interpretation services, and calculating fees from the measured time and the accounting information registered in
5 the interpreter registration table.

Since the interpreter registration table ~~contains~~includes the accounting information ~~on~~of the interpreters, it is possible to charge proper fees for the telephone interpretation services.

10 Here, the interpreter registration table may ~~contain~~include the language-specific interpretation levels of the interpreters ~~as~~such that the accounting information is obtained ~~by~~ using an accounting table which defines the relationship between the interpretation levels and hourly
15 rates. Consequently, it is possible to charge proper fees in accordance with the levels of the interpreters.

~~—The above object, other objects,~~ Other features, elements, steps, characteristics and advantages of the present invention will become more apparent from the following
20 detailed description of preferred embodiments ~~of the invention—~~
~~made in conjunction~~thereof with ~~the~~reference to the attached drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

25 Fig. 1 is a block diagram showing a telephone

interpretation assistance device according to a first
preferred embodiment of the present invention;

Fig. 2 is a system block diagram showing a practical
example of a telephone interpretation system using the
5 telephone interpretation assistance device according to the
first preferred embodiment of the present invention;

Fig. 3 is a chart showing an example of an interpreter
registration table in the telephone interpretation system of
Fig. 2;

10 Fig. 4 is a process flowchart showing an example of
connection processing of a control unit in the telephone
interpretation system of Fig. 2;

Fig. 5 is a block diagram showing a telephone
interpretation assistance device according to a preferred
15 second embodiment of the present invention;

Fig. 6 is a system block diagram showing a practical
example of a telephone interpretation system using an
interpretee telephone interpretation assistance device out of
the telephone interpretation assistance device according to
20 the second preferred embodiment of the present invention;

Fig. 7 is a chart showing an example of an interpreter
registration table in the telephone interpretation system of
Fig. 6;

Fig. 8 is a process flowchart showing an example of
25 connection processing of a control unit in the telephone

interpretation system of Fig. 6;

Fig. 9 is a block diagram showing a practical example of a recording and reproducing function in the telephone interpretation system of Fig. 2; and

5 Fig. 10 is a block diagram showing a practical example of a recording and reproducing function in the telephone interpretation system of Fig. 6.

~~BEST MODE FOR CARRYING OUT THE INVENTION~~

10 DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Fig. 1 is a block diagram showing a telephone interpretation assistance device according to a first preferred embodiment of the present invention. In the diagram, the reference numeral 10 designates the telephone interpretation assistance device, which ~~comprises~~includes a headset connection jack 16 to which a headset to be used by an interpretee A is connected, a headset connection jack 17 to which a headset to be used by a conversation partner B is connected, and a telephone connection jack 18 to which a telephone terminal 1 for ~~holding~~conducting a call with an interpreter is connected. The device further ~~comprises~~includes a synthesis circuit 12 which synthesizes voice signals input from the two headsets connection jacks 16 and 17 and outputs the resultant to the telephone connection jack 18, a switching circuit 14 which switches and supplies a voice signal input

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20

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from the telephone connection jack 18 to either one of the two headset connection jacks 16 and 17, and a detection circuit 15 which generates a switch signal from the voice signal input from the telephone connection jack 18.

5 The detection circuit 15 ~~has~~includes the function of detecting a tone signal in the voice signal input from the telephone connection jack 18. When an interpreter C pushes a button on a telephone terminal 2 during the service, the detection circuit 15 detects the number pushed ~~number~~ and
10 sends the switch signal to the switching circuit 14. For example, ~~suppose that~~ a button "1" is to be pushed when the language of the conversation partner B is interpreted for the interpretee A, and a button "2" is to be pushed when the language of the interpretee A is interpreted for the
15 conversation partner B. Then, ~~the~~ detection circuit 15 transmits a PB-A signal to the switching circuit 14 when it detects the tone signal of the button "1", and transmits a PB-B signal to the switching circuit 14 when it detects the tone signal of the button "2".

20 When the switching circuit 14 receives the PB-A signal from the detection circuit 15, it transmits the voice signal of the interpreter C, input from the telephone connection jack 18, to the headset connection jack 16 to which the headset of the interpretee A is connected. When the switching circuit 14
25 receives the PB-B signal from the detection circuit 15, it

transmits the voice signal of the interpreter C, input from the telephone connection jack 18, to the headset connection jack 17 to which the headset of the conversation partner B is connected.

5 Since the voice of the interpretee A and the voice of the conversation partner B are synthesized by the synthesis circuit 12 and the ~~resultant~~results is transmitted to the interpreter C, the interpreter C can listen to the voices of the ~~two~~both from the telephone terminal 2. Moreover, the voice
10 of the interpreter C is transmitted to the interpretee A when the interpreter pushes the button "1" before ~~speech~~speaking. The voice is transmitted to the conversation partner B when the interpreter pushes the button "2" before ~~speech~~speaking.

Consequently, while listening to the speech of the
15 interpretee A, the interpreter C can conduct simultaneous interpretation and transmit the interpreting voice only to the conversation partner B. In addition, while listening to the speech of the conversation partner B, the interpreter C can conduct simultaneous interpretation and transmit the
20 interpreting voice only to the interpretee A.

Thus, the voice of the interpreter is transmitted only to the destination of interpretation designated by the interpreter from the terminal, without interrupting the speech of the speaker. This ~~can avoid~~prevents a mix-up in
25 conversation, ~~allowing~~and enables quick and precise

interpretation.

~~Incidentally, the~~ The telephone interpretation assistance device 10 is connected with the telephone terminal 1 when receiving interpretation services, and any type of telephone terminal may be connected as long as it has external voice input and output functions. ~~Nevertheless,~~ However, in view of interpretation services ~~on the move~~ to be obtained while traveling, such as on overseas trips and at overseas business occasions, a ~~radio-cellular~~ phone is preferable-
10 ~~connected~~.

In the foregoing preferred embodiment, the switching circuit 14 is used as the switching means for supplying the voice of the interpreter C to either one of the interpretee A and the conversation partner B which is designated from the interpreter terminal 2. ~~Nevertheless~~ However, attenuator circuits for suppressing the supply of the voice signal to the unnecessary side may be used instead of the switch. In this case, the supply of the voice signal to the unnecessary side may be attenuated to ~~some~~ a desired audible level, and not
15 ~~being shut off~~ be completely turned off. This ~~allows~~ enables the interpretee or the conversation partner to speak while ~~checking~~ verifying that his/her own voice is being interpreted for the other party by the interpreter.

The foregoing preferred embodiment ~~has dealt with the~~
25 ~~case where~~ describes a configuration in which the synthesis

circuit 12 ~~simply~~merely synthesizes the voice signals input from the two headset connection jacks 16 and 17, and outputs the resultant to the telephone connection jack 18. However, the two voice signals may be multiplexed. ~~Suppose~~If, for
5 example, ~~that~~ the voice signal from the headset 16 and the voice signal from the headset 17 are stereophonically synthesized as ~~the~~a left channel and ~~the~~a right channel, respectively. ~~Then,~~then, if the telephone terminal 2 to be used by the interpreter C has a voice demultiplexing function,
10 the voice of the interpretee A and the voice of the conversation partner B are heard from the left and the right of the headset 2C, respectively. This makes it possible to clearly ~~recognized~~determine which voice is which, and to accurately designate the destination of interpretation ~~without~~
15 ~~fail~~. This ~~allows~~enables quicker and more precise interpretation.

Fig. 2 shows an example of a system configuration of the telephone interpretation system for providing interpretation services by using the telephone interpretation assistance
20 device according to the first preferred embodiment of the present invention. In the diagram, the reference numeral 100 designates the telephone interpretation system which is installed in an interpretation center for providing interpretation services. The telephone interpretation system
25 100 connects a telephone terminal 1 to be used by the

interpretee (hereinafter, referred to as interpretee terminal)
and a telephone terminal 2 to be used by the interpreter
(hereinafter, referred to as interpreter terminal) via public
telephone lines 40. The telephone interpretation system 100
5 thus provides telephone interpretation services by having the
interpreter interpret a ~~meeting~~-conversation between the
interpretee and his/her conversation partner by telephone.

The telephone interpretation system 100 ~~comprises~~
includes an interpretee terminal line interface (hereinafter,
10 "interface" will be abbreviated as I/F) 120 and an interpreter
terminal line I/F 140 for establishing a connection with the
interpretee terminal and the interpreter terminal,
respectively. The line I/Fs are connected with voice input and
output units 122 and 142 for inputting and outputting voices
15 to/from the respective terminals.

The voice input of the interpretee terminal voice input
and output unit 122 is connected ~~with~~-to a voice synthesis
unit 124 for synthesizing the voice output of the interpreter
terminal voice input and output unit 142 and the voice output
20 of an interpretee terminal voice telop memory 126. The voice
input of the interpreter terminal voice input and output unit
142 is connected ~~with~~-to a voice synthesis unit 144 for
synthesizing the voice output of the interpretee terminal
voice input and output unit 122 and the voice output of an
25 interpreter terminal voice telop memory 146.

The telephone interpretation system 100 includes a control unit 110 having an interpreter registration table 112 into which the terminal numbers of interpreter terminals to be used by interpreters are registered. The control unit 110 is
5 connected ~~with~~to each of the line I/Fs 120 and 140, the voice input and output units 122 and 142, the voice synthesis units 124 and 144, and the telop memories 126 and 146. The telephone interpretation system 100 provides functions for connecting the interpretee terminal~~,~~ and the interpreter terminal. The
10 functions include~~+~~ accepting a call from the interpretee terminal~~,~~ and acquiring the language type of the interpretee and the language type of his/her conversation partner~~,~~ and acquiring an interpreter selection condition~~,~~ and extracting the terminal number of the interpreter by referencing the interpreter
15 registration table 112 based on the language types and the selection condition acquired~~,~~ and calling the interpreter terminal by using the terminal number extracted.

The inputs of the voice synthesis units 124 and 144 are connected with the interpretee terminal voice telop memory 126~~,~~
20 and the interpreter terminal voice telop memory 146~~,~~
respectively. The contents of the voice telop memories 126 and 146 can be set by the control unit 110. Consequently, when holding a telephone conversation through an interpreter, it is possible to transmit necessary voice messages to the
25 individual terminals and establish a telephone connection by

setting the voice telop memories 126 and 146 with messages for the respective terminals.

Next, description will be given of the connection processing by the control unit 110 for holding a telephone
5 conversation through an interpreter.

Prior to the processing, interpreter selection information and the terminal numbers of the terminals to be used by respective interpreters are registered into the interpreter registration table 112 of the control unit 110 .
10 from an appropriate terminal (not shown). Fig. 3 shows examples of entry items to be registered into the interpreter registration table 112. The interpreter selection information is information for selecting interpreters desired by users, and includes such entries as gender, age, language
15 capabilities, residence, and the fields of specialization. For language capabilities, the language-specific levels of the interpreters are registered ~~so~~such that the users can select interpreters of desired levels in both intended languages. Here, the advanced, intermediate, and primary levels of
20 interpretation are expressed as 1, 2, and 3, respectively. The entries ~~on~~of the residence are made on the assumption that some users may desire persons who have geographic knowledge ~~on~~about certain areas. ~~Zip~~The zip code is used ~~here~~for area specification. The entries ~~on~~of the fields of specialization
25 are made on the assumption that some users may desire persons

who have specialized knowledge ~~en~~about a field or are well informed in topics of the field when the conversation will deal with the field of specialization. Here, the specialized fields of the interpreters can be registered in such subsections as politics, law, business, education, science and technology, medical, linguistics, sports, and hobbies. Since the fields of specialization range widely, hierarchical entries may be made in advance ~~es~~such that the entries are searched into levels desired by users at the time of selection.

10 Alternatively, qualifications possessed by the individual interpreters may be registered ~~es~~such that interpreters who ~~carry~~possess qualifications desired by the users can be selected.

For the terminal numbers, the telephone numbers of the terminals are registered since the target terminals are telephone terminals to be connected to public telephone lines.

The interpreter registration table 112 also ~~contains~~includes availability flags for indicating whether the corresponding interpreters are available or not. Registered interpreters can call the interpretation center from their own terminals and input commands from their dial pads to set or reset their availability flags. Consequently, the registered interpreters can avoid unnecessary calls by setting their availability flags in the interpreter registration table only when they are available. The users can also select available

interpreters quickly.

Fig. 4 shows the process flow of the connection processing by the control unit 110. The telephone interpretation system 100 accepts an order for interpretation services when the interpretee calls the telephone number of the interpretee terminal line I/F. The telephone interpretation system 100 then calls an interpreter terminal, and establishes connection for the telephone interpretation services.

As shown in the chart, the presence of a call to the interpretee terminal line I/F 120 is detected ~~initially~~ (S100). When a call is detected, a message ~~for requesting to an~~ input of the language type of the interpretee is output to the interpretee terminal (S102). This is ~~effected~~ performed by ~~setting the interpretee providing the interpretee voice telop~~ memory 126 with voice messages such as "If you speak Japanese, please press 1#" (in Japanese), "If you speak English, please press 2#", Subsequent messages to the interpretee terminal and the interpreter terminal will be ~~given~~ provided in the acquired language type of the interpretee. The language type of the interpretee, that is input by the interpretee ~~in response,~~ is thus acquired ~~thus~~ (S104).

Next, a message ~~for requesting to an~~ input of the language type of the conversation partner is output to the interpretee terminal (S106). For example, if the interpretee

is a Japanese, the message is given by ~~setting~~providing the
interpretee voice telop memory 126 with voice messages such as
"If the language of the conversation partner is English, press
1#. If German, press 2#. ..." (in Japanese). The language type
5 of the conversation partner, that is input by the interpretee
~~in response,~~ is thus acquired ~~thus~~ (S108).

Now, a message ~~for requesting to an input of an~~
interpreter selection condition is output to the interpretee
terminal (S110). This is ~~effected~~achieved by ~~setting~~providing
10 the interpretee voice telop memory 126 with voice messages
such as "If a male interpreter is desired, press 1#. If female,
press 2#. If you do not care, press 0#", "If an interpreter
under the age of 20 is desired, press 1#. For 20 to 39, press
2#. For 40 and above, 3#. If do not care, press 0#", "If any
15 area specification is desired, press zip code and #. If not,
press 0#", "To specify the fields of specialization, press 1
for politics, 2 for law, 3 for business, 4 for education, 5
for science and technology, Press # in conclusion", and
"To specify interpretation level, press 1# for advanced, 2#
20 for intermediate, and 3# for primary. If do not care, press
0#". The interpreter selection condition that is input by the
interpretee ~~in response~~ is thus acquired ~~thus~~ (S112).

Next, the interpreter registration table 112 is
~~referred~~referenced to select an interpreter who has the
25 specified interpretation level in the language of the

interpretee and the language of his/her conversation partner₇
and that matches ~~with the~~ acquired selection condition
including gender, age, residence, and/or the fields of
specialization, and has his/her availability flag set (S114).

5 Here, registration information ~~on~~about the selected
interpreter may be ~~notified~~provided via a voice message ~~so~~such
that the interpretee makes a final selection on the
interpreter. In addition, the hourly rate (to be described
later) of the interpreter₇ that is registered in the
10 interpreter registration table 112₇ may be ~~notified~~provided
via a voice message. This ~~allows~~enables the users to select
appropriate interpreters in consideration of the fees
necessary for the interpretation services.

Next, the terminal number of the selected interpreter is
15 extracted from the interpreter registration table 112 and
called (S116). Here, the interpreter terminal may be notified
of personal information ~~on~~of the interpretee, the language
types of the interpretee and his/her conversation partner, the
interpreter selection condition, and ~~the like~~ other useful
20 information by using the interpreter terminal voice telop
~~memory~~memory 146. Whether or not to accept the request for
interpretation can be checked in this ~~way~~ manner. For example,
the personal information on the interpretee may be member
information registered in advance, provided that the
25 interpretation services are offered on a membership basis.

When the interpreter terminal has accepted the call (S118), the telephone interpretation services are started (S120).

~~In case~~ If the selected interpreter terminal does not
5 accept the call in S118, whether a next candidate is available is determined (S122). ~~In case~~ If a next candidate is available, the processing returns to S114 ~~to repeat~~ and is repeated.
Otherwise, the interpretee terminal is notified ~~as of~~ such and the call is released (S124).

10 The control unit 110 ~~has~~ includes a timer (not shown) for calculating the fee for interpretation services. The timer measures the time from the beginning of a connection to the disconnection. The interpreter registration table 112 ~~contains~~ includes entries ~~on~~ of the hourly rates of the
15 interpreters (not shown). At the end of interpretation services, the fee is calculated from the time measured by the timer and the hourly rates registered in the interpreter registration table 113. The calculated fee is registered into an accounting database 114, and charged to the user at a later
20 time.

~~Incidentally, the~~ The hourly rates of the interpreters may be determined from the interpretation levels registered in the interpreter registration table 112, by referencing an accounting table ~~provided that is~~ separately
25 provided. Here, the accounting table ~~shall be defined~~ defines the

relationship between the interpretation levels of the interpreters and the hourly rates.

The foregoing preferred embodiment ~~has dealt with the case where~~ describes a configuration in which if the
5 interpreter terminal selected does not accept the call, an appropriate message is simply ~~posted~~sent to the interpretee before disconnection. ~~Nevertheless,~~ However, an interpretation reservation table for registering the terminal number of the interpretee may be provided ~~as~~such that the interpretee
10 terminal ~~can be~~is notified to start the telephone interpretation service when the selected interpreter ~~has accepted~~accepts the call.

The foregoing preferred embodiment ~~has dealt with the case where~~ describes a configuration in which the interpretee
15 enters the language type of the interpretee and the language type of his/her conversation partner for ~~the sake of~~ selecting an interpreter. ~~Nevertheless~~However, the language type of the interpretee or his/her conversation partner may be acquired automatically by providing the interpretation center with
20 telephone numbers for respective ~~interpretee~~interpretee languages or respective combinations of interpretee languages and his/her conversation partner languages. The foregoing preferred embodiment ~~has also dealt with the case where~~ describes a configuration in which the interpretee enters the
25 interpreter selection condition for ~~the sake of~~ selecting an

interpreter. ~~Nevertheless~~However, whether or not to specify
the interpreter selection condition may be inquired
~~initially, about first.~~ If the interpreter selection condition
is not to specify desired, an interpreter may be selected based
5 on the entered language types alone.

Moreover, in emergency situations, an interpreter in
charge of emergency response may be called automatically by
the interpretee pressing certain dial numbers ~~initially.~~

The foregoing preferred embodiment ~~has dealt with the~~
10 ~~case where describes a situation in which~~ the telephone
interpretation system 100 is ~~composed of~~ defined by the line
I/Fs, the voice input and output units, the voice synthesis
units, and the control unit, ~~and so on. Nevertheless.~~
However, these components need not necessarily be configured
15 as separate pieces of hardware. The functions of the units may
be ~~achieved in the form of~~ provided by software processing by
using a computer.

The foregoing preferred embodiment ~~has dealt with the~~
~~case where describes a situation in which~~ the interpreter
20 terminal 2 is located outside the interpretation center as the
interpretee terminal 1 is, and provides interpretation
services when called from the interpretation center via the
public telephone lines. However, the present invention is not
limited thereto. It is understood that some or all of the
25 interpreter terminals may be installed in the interpretation

center ~~as~~such that interpretation services are provided from the interpretation center.

~~Incidentally, in~~ In the foregoing preferred embodiment, the interpreters can participate in interpretation services
5 from anywhere as long as they have terminals capable of connection with public telephone lines. The interpreters can thus make effective use of their ~~unoccupied hours~~free time to provide interpretation services by using the availability flags mentioned above. This ~~allows~~enables efficient and stable
10 operation of interpretation services which often have difficulty in securing necessary personnel.

The foregoing preferred embodiment ~~has dealt with the case where~~ describes a configuration in which an interpreter is in charge of both interpreting the language of the
15 conversation partner into the language of the interpretee and interpreting the language of the interpretee into the language of the conversation partner. ~~Nevertheless~~However, a first interpreter for interpreting the language of the conversation partner into the language of the interpretee and a second
20 interpreter for interpreting the language of the interpretee into the language of the conversation partner may be selected individually to perform bidirectional simultaneous interpretation.

Fig. 5 is a block diagram showing a telephone
25 interpretation assistance device according to a second

preferred embodiment of the present invention for achieving bidirectional simultaneous interpretation. In the diagram, the reference numeral 20 designates an interpretee-side telephone interpretation assistance device to be used on the interpretee side. The interpretee-side telephone interpretation assistance device 20 ~~has~~ includes a headset connection jack 26 to which a headset to be used by an interpretee-side A is connected, a headset connection jack 27 to which a headset to be used by a conversation partner B is connected, and a telephone connection jack 28 to which a telephone terminal 1 for ~~holding~~ conducting a call with interpreters is connected. The device further ~~comprises~~ includes a multiplexer circuit 22 which multiplexes a voice signal input from the headset connection jack 26 as the first channel and a voice signal input from the headset connection jack 27 as the second channel, and outputs the ~~resultant~~ to the telephone connection jack 28, and a demultiplexer circuit 24 which demultiplexes a voice signal input from the telephone connection jack 28, and outputs the first channel of the ~~resultant~~ to the headset connection jack 26 and the second channel of the ~~resultant~~ to the headset connection jack 27.

~~Meanwhile, the~~ The reference numeral 30 designates an interpreter-side telephone interpretation assistance device to be used on the interpreter side. The interpreter-side

telephone interpretation assistance device 30 ~~has~~ includes a

headset connection jack 36 to which a headset to be used by a first interpreter C interpreting the language of the conversation partner B into the language of the interpretee A is connected, a headset connection jack 37 to which a headset to be used by a second interpreter D interpreting the language of the interpretee A into the language of the conversation partner B is connected, and a telephone connection jack 38 to which a telephone terminal 2 to be used by the interpreters is connected. The device further ~~comprises~~includes a demultiplexer circuit 32 which demultiplexes a voice signal input from the telephone connection jack 38 and outputs the first channel of the resultant to the headset connection jack 37 and the second channel ~~to of~~of the resultant to the headset connection jack 36, and a multiplexer circuit 34 which multiplexes a voice signal input from the headset connection jack 36 as the first channel and a voice signal input from the headset connection jack 37 as the second channel, and outputs the resultant to the telephone connection jack 38.

Consequently, the voice of the interpretee A is transmitted to the second interpreter D, the voice of the second interpreter D is transmitted to the conversation partner B, the voice of the conversation partner B is transmitted to the first interpreter C, and the voice of the first interpreter C is transmitted to the interpretee A.

Consequently, the first interpreter C can listen to the

speech of the conversation partner B and conduct simultaneous interpretation without interrupting the speech of the conversation partner B. The second interpreter can listen to the speech of the interpretee A and conduct simultaneous
5 interpretation without interrupting the speech of the interpretee A. Unnecessary voices are not transmitted to ~~even~~ the interpreters. It is therefore possible to avoid a mix-up in conversation, ~~allowing~~which enables quick and precise bidirectional simultaneous interpretation.

10 The foregoing preferred embodiment ~~has dealt with the case where~~describes a configuration in which the first interpreter listens only to the voice of the conversation partner for interpretation, and the second interpreter listens only to the voice of the interpretee for interpretation.

15 ~~Nevertheless~~However, the headsets 2C and 2D to be used by the interpreters may be ~~of stereo earphone type~~ stereo earphones such that the first channel and the second channel separated by the demultiplexer circuit 32 are output to both of the headset connection jacks 36 and 37. Consequently, each of the
20 interpreters can listen separately to the voices of both the interpretee and the conversation partner from the stereo earphones ~~separately~~, and conduct interpretation while checking the progress of the entire conversation and the reaction of the targets of interpretation.

25 Moreover, in the demultiplexer circuit 32, the first

channel may be attenuated and added to the second ~~channel~~
channel which is to be supplied to the headset connection jack

36. The second channel may be attenuated and added to the
first channel which is to be supplied to the headset

5 connection jack 37. As a result, even if the headsets 2C and
2D are not ~~of stereo earphone type~~earphones, the interpreters
can listen not only to the speeches of the respective intended
speakers to interpret but also to the speeches of the targets
of interpretation. It is therefore possible to conduct
10 interpretation while checking the progress of the entire
conversation and the reactions of the targets of
interpretation.

Fig. 6 shows an example of system configuration of the
telephone interpretation system for providing interpretation
15 services by using the interpretee-side telephone
interpretation assistance device 20 ~~out of~~ the telephone
interpretation assistance device according to the second
preferred embodiment of the present invention. In the diagram,
the reference numeral 200 designates the telephone
20 interpretation system which is installed in an interpretation
center for providing bidirectional simultaneous interpretation
services. The telephone interpretation system 200 connects a
telephone terminal 1 to be used by the interpretee
(hereinafter, referred to as interpretee terminal), a
25 telephone terminal 3 to be used by the first interpreter

(hereinafter, referred to as first interpreter terminal), and a telephone terminal 4 to be used by the second interpreter (hereinafter, referred to as second interpreter terminal) via public telephone lines 40. The telephone interpretation system 200 thus provides telephone interpretation services by having the first and second interpreters conduct bidirectional simultaneous interpretation of a meeting between the interpretee and the conversation partner by telephone.

The telephone interpretation system 200 ~~has~~includes an interpretee terminal line I/F 220, a first interpreter terminal line I/F 240, and a second interpreter terminal line I/F 260. The line I/Fs are connected ~~with~~to voice input and output units 222, 242, and 262 for inputting and outputting voices to/from the respective terminals.

The voice input of the interpretee terminal voice input and output unit 222 is connected ~~with~~to a multiplexer unit 223. The multiplexer unit 223 multiplexes the voice output of a voice synthesis unit 224 as the first channel (A) and the voice output of the second interpreter terminal voice input and output unit 262 as the second channel (B). The voice synthesis unit 224 synthesizes the voice output of the first interpreter terminal voice input and output unit 242 and the voice output of an interpretee terminal voice telop memory 226.

The voice input of the first interpreter terminal voice input and output unit 242 is connected ~~with~~to a voice

synthesis unit 244. The voice synthesis unit 244 synthesizes the second channel output (B) of a demultiplexer unit 225 and the voice output of a first interpreter terminal voice telop memory 246. The demultiplexer unit 225 demultiplexes the voice output of the interpretee terminal voice input and output unit 222. The voice input of the second interpreter terminal voice input and output unit 262 is connected with a voice synthesis unit 264. The voice synthesis unit 264 synthesizes the first channel output (A) of the demultiplexer unit 225 and the voice output of a second interpreter terminal voice telop memory 266.

Consequently, the voice of the interpretee A is transmitted to the second interpreter D, the voice of the second interpreter D is transmitted to the conversation partner B, the voice of the conversation partner B is transmitted to the first interpreter C, and the voice of the first interpreter C is transmitted to the interpretee A.

Consequently, the first interpreter C can listen to the speech of the conversation partner B and conduct simultaneous interpretation without interrupting the speech of the conversation partner B. The second interpreter can listen to the speech of the interpretee A and conduct simultaneous interpretation without interrupting the speech of the interpretee A. Unnecessary voices are not transmitted to ~~even~~ the interpreters. It is therefore possible to avoid a mix-up in conversation, allowing which enables quick and precise

bidirectional simultaneous interpretation.

The foregoing preferred embodiment ~~has dealt with the~~
~~case where~~ describes a configuration in which the first
interpreter listens only to and interprets the voice of the
5 conversation partner, and the second interpreter listens only
to and interprets the voice of the interpretee. Nevertheless,
the voice of the interpretee and the voice of the second
interpreter may be attenuated and added to the voice to be
transmitted to the first interpreter, or multiplexed into the
10 same, for transmission. The voice of the conversation partner
and the voice of the first interpreter may be attenuated and
added to the voice to be transmitted to the second interpreter,
or multiplexed into the same, for transmission. In this case,
as mentioned above, the interpreters can conduct
15 interpretation while checking the progress of the entire
conversation and reactions of the other parties of
interpretation.

The telephone interpretation system 200 includes a
control unit 210 having an interpreter registration table 112
20 into which the terminal numbers of interpreter terminals to be
used by interpreters are registered. The control unit 210 is
connected with each of the line I/Fs 220, 240 and 260, the
voice input and output units 222, 242 and 262, the voice
synthesis units 224, 244 and 264, and the telop memories 226,
25 246 and 266. The control unit 210 provides functions for

connecting the ~~interpretee~~interpretee terminal, the first interpreter terminal, and the second interpreter terminal. The functions include→ accepting a call from the interpretee terminal→, acquiring the language type of the interpretee and
5 the language type of his/her conversation partner→, acquiring an interpreter selection condition→, extracting the terminal numbers of the first and second interpreters by referencing the interpreter registration table 212 based on the language types and the selection condition acquired→, calling the first
10 interpreter terminal and the second interpreter terminal by using the terminal numbers extracted.

The inputs of the voice synthesis units 224, 244 and 264 are connected ~~with~~to the interpretee terminal voice telop memory 226, the first interpreter terminal voice telop memory
15 246, and the second interpreter terminal voice telop memory 266, respectively. The contents of the voice telop memories 226, 246 and 266 are set by the control unit 210. Consequently, when holding a telephone conversation through interpreters, it is possible to output necessary voice messages to the
20 individual terminals and establish a three-party call by setting the voice telop memories 226, 246 and 266 with messages for the respective terminals.

Next, description will be given of the connection processing by the control unit 210 for holding a telephone
25 conversation with bidirectional simultaneous interpretation.

Again, the interpreter selection information and the terminal numbers of terminals to be used by the respective interpreters are registered into the interpreter registration table 212 of the control unit 210 from an appropriate terminal (not shown) before the processing. Fig. 7 shows examples of entry items to be registered into the interpreter registration table 212. As shown in the chart, the entry items to be registered into the interpreter registration table 212 are equivalent to those of the interpreter registration table 112 shown in Fig. 3. For language capabilities, however, the levels of listening comprehension and the levels of speaking abilities are registered separately. Consequently, interpreters that are the most suitable for the first interpreter who interprets the language of the conversation partner into the language of the interpretee and the second interpreter who interprets the language of the interpretee into the language of the conversation partner can be selected individually.

Fig. 8 shows the process flow chart of the connection processing by the control unit 210. The telephone interpretation system 200 accepts an order for interpretation services when the interpretee calls the telephone number of the interpretee terminal line I/F. The telephone interpretation system 200 then calls a first interpreter terminal, a second interpreter terminal, and establishes

connection for the bidirectional simultaneous telephone interpretation services.

As shown in the chart, the presence of a call to the interpreter terminal line I/F 220 is detected ~~initially~~ (S200).

5 When a call is detected, a message ~~for requesting to an~~ input of the language type of the interpreter is output to the interpreter terminal (S202) as in the first preferred embodiment. The language type of the interpreter, that is input by the interpreter ~~in response,~~ is thus acquired ~~thus~~ (S204). Next, a message ~~for requesting to an~~ input of the language type of the conversation partner is output to the interpreter terminal by using the acquired language type of the interpreter (S206) as in the first preferred embodiment. The language type of the conversation partner, that is input 15 by the interpreter ~~in response,~~ is thus acquired ~~thus~~ (S208). Next, a message ~~for requesting to an~~ input of an interpreter selection condition is output to the interpreter terminal (S210) as in the first preferred embodiment. The interpreter selection condition that is input by the interpreter ~~in response~~ is thus acquired ~~thus~~ (S212). 20

Next, the interpreter registration table 212 is ~~referred~~ referenced to select a first interpreter (S214). Here, the first interpreter ~~shall~~ is selected to have the specified interpretation levels, or a level of listening comprehension 25 in the language of the conversation partner and a level of

speaking ability in the language of the interpretee, to match
with the acquired selection condition including gender, age,
residence, and the fields of specialization, and to have
his/her availability flag set. The terminal number of the
5 selected interpreter is extracted and called (S216).

When the first interpreter terminal has accepted the call
(S218), the interpreter registration table 212 is
~~referred~~referenced to select a second interpreter (S220). The
second interpreter ~~shall~~is selected to have the specified
10 interpretation levels, or a level of listening comprehension
in the language of the interpretee and a level of speaking
ability in the language of the conversation partner, to match
with the acquired selection condition including gender, age,
residence, and the fields of specialization, and to have
15 his/her availability flag set. The terminal number of the
selected interpreter is extracted and called (S222).

When the second interpreter terminal has accepted the
call (S224), the telephone interpretation services with
bidirectional simultaneous interpretation are started (S226).

20 ~~In case~~If the first interpreter terminal does not accept
the call in S218, whether a next candidate is available is
determined (S230). ~~In case~~If a next candidate is available,
the processing returns to S214 ~~to repeat~~and is repeated.
Otherwise, the interpretee terminal is notified ~~as such~~ and
25 the call is released (S232). ~~In case~~If the second interpreter

terminal does not accept the call in S224, whether a next candidate is available is determined (S234). ~~In case~~If a next candidate is available, the processing returns to S220 ~~to repeat and is repeated.~~ Otherwise, the interpretee terminal
5 and the first interpreter terminal are notified ~~as such and~~ the calls are released (S235).

For the sake of simplicity, the selection of the first interpreter (S214) and the selection of the second interpreter (S220) have been described for situations ~~where~~in which the
10 interpreter registration table 212 is ~~referred~~referenced to select interpreters who match with the ~~predetermined~~desired condition. ~~Nevertheless,~~However, as in the first preferred embodiment, the registered information ~~on~~of the appropriate interpreters may be ~~notified~~provided via voice messages ~~so~~
15 such that the interpretee makes final selections ~~on~~of both of the first and second interpreters.

The control unit 210 ~~has~~includes a timer (not shown) for calculating the fee for interpretation services. The timer measures the time from the beginning of a connection to the
20 disconnection. The interpreter registration table 212 ~~contains~~includes entries ~~on~~of the hourly rates of the interpreters (not shown). At the end of interpretation services, the fee is calculated from the time measured by the timer and the hourly rates of the first and second
25 interpreters registered in the interpreter registration table

212. The calculated fee is registered into an accounting database 214, and charged to the user at a later time.

~~Incidentally, the~~ The hourly rates of the interpreters may be determined from the interpretation levels registered in the interpreter registration table 212, by referencing an accounting table ~~provided~~ that is separately provided. Here, the accounting table ~~shall define~~ defines the relationship between the interpretation levels of the interpreters and the hourly rates.

10 The foregoing preferred embodiment ~~has dealt with the case where~~ describes a configuration in which if the selected interpreter terminals do not accept the call, an appropriate message is simply posted to the interpretee before disconnection. ~~Nevertheless~~ However, an interpretation reservation table for registering the terminal number of the interpretee may be provided ~~so~~ such that the interpretee ~~can be~~ is notified to start the telephone interpretation service when both of the selected first and second interpreters ~~answer~~ accept the call.

20 The foregoing preferred embodiment ~~has dealt with the case where~~ describes a configuration in which the telephone interpretation system 200 is ~~composed of~~ defined by the line I/Fs, the voice input and output units, the voice synthesis units, and the control unit, ~~and so on. Nevertheless.~~

25 However, these components need not necessarily be configured

as separate pieces of hardware. The functions of the units may be ~~achieved in the form of~~ provided by software processing by using a computer.

The foregoing preferred embodiment ~~has dealt with the~~
5 ~~case where~~ describes a configuration in which the first interpreter terminal 3 and the second interpreter terminal 4 are located outside the interpretation center ~~as~~ similar to the interpreter terminal 1 ~~is~~, and provide interpretation services when called from the interpretation center via the public
10 telephone lines. However, the present invention is not limited thereto. It is understood that some or all of interpreter terminals may be installed in the interpretation center ~~as~~ such that interpretation services are provided from the interpretation center.

15 ~~Incidentally, in~~ In the foregoing preferred embodiment, the interpreters can participate in interpretation services from anywhere as long as they have terminals capable of connection with public telephone lines. The interpreters can thus make effective use of their ~~unoccupied hours~~ free time to
20 provide interpretation services by using the availability flags mentioned above. This ~~allows~~ enables efficient and stable operation of interpretation services which often have difficulty in securing necessary personnel.

Finally, description will be given of a recording and
25 reproducing function for recording voices during telephone

interpretation services, and reproducing and transmitting the same by user requests.

Fig. 9 shows a practical example of the recording and reproducing function in the telephone communication system in Fig._2. As shown in the diagram, the voice output of the voice synthesis unit 124 to be transmitted to the interpretee terminal and the voice output of the voice synthesis unit 144 to be transmitted to the interpreter terminal are multiplexed as ~~the~~a left channel and ~~the~~a right channel, respectively, by a voice multiplexing unit 118. The resultant is transmitted to a voice recording and reproducing unit 119.

During interpretation services, the voice output of the voice multiplexing unit 118 is automatically recorded by the voice recording and reproducing unit 119 ~~at~~by a command from the control unit 110, and is stored user by user. The voices stored in the voice recording and reproducing unit 119 are reproduced by a command from the control unit 110 when the voice input and output unit 122 detects that predetermined dial numbers are pressed from the interpretee terminal. The reproduced voices are transmitted to each terminal via the voice synthesis unit 124 of the detected terminal.

Consequently, if the user terminals have a voice demultiplexing function, the voices of the respective terminals during interpretation services can be ~~checked~~reviewed in the language of the interpretee on the left

channel and in the language of the interpreter on the right channel. ~~Incidentally, users~~Users can also reproduce and ~~check~~review the voices stored in the voice recording and reproducing unit 119 ~~afterward~~at a later time by calling the interpretation center and inputting predetermined access code from their terminals.

~~Incidentally, the~~ The method of synthesizing the voices to be recorded into the voice recording and reproducing unit is not limited to the foregoing ~~one~~. Any kind of method may be used as long as the users can check the details of the interpretation services. Since some user terminals do not ~~have~~include the voice demultiplexing function, the voices to be transmitted to the interpretee terminal and the voices to be transmitted to the interpreter terminal may be recorded separately. In this case, either one of the voices designated from a terminal can be reproduced for transmission.

Moreover, when the synthesis circuit 12 of the telephone interpretation assistance device 10 is capable of multiplexing as described above, ~~there may be provided a~~ demultiplexing unit ~~for separating~~may be provided to separate the voice output of the interpretee terminal voice input and output unit 122 into the voice of the interpretee and the voice of the conversation partner. Here, a switching unit and a PB detection unit equivalent to the switching circuit 14 and the PB detection circuit 15 in the telephone interpretation

assistance device 10 are provided ~~so~~such that the destination of the voice of the interpreter is switched between the interpretee and the conversation partner. The interpretee voice output from the demultiplexing unit and the interpretee-bound voice output from the switching unit are synthesized as the left channel, and the conversation partner voice output from the demultiplexing unit and the partner-bound voice output from the switching unit are synthesized as the right channel. The left and right channels are then multiplexed by the voice multiplexing unit 118 and recorded into the voice recording and reproducing unit 119.

Consequently, if the user terminals have a voice demultiplexing function, the voices of the respective terminals during interpretation services can be checked in the language of the interpretee on the left channel and in the language of the conversation partner on the right channel.

The users may include persons other than those who have received the interpretation services. The voices stored in the voice recording and reproducing unit 119 may also be reproduced and transmitted when access-authorized persons call the interpretation center by using their telephone terminals and input predetermined access code.

Fig. 10 shows a practical example of the recording and reproducing function in the telephone communication system with bidirectional simultaneous interpretation of Fig. 6. As

shown in the diagram, the first channel output (A) of the interpreter terminal demultiplexing unit 225 and the voice output of the first interpreter terminal voice input and output unit 242 are synthesized by a voice synthesizer 216.

5 The second channel output (B) of the interpreter terminal demultiplexing unit 225 and the voice output of the second interpreter terminal voice input and output unit 262 are synthesized by a voice synthesizer 217. The output voice of the voice synthesizer 216 and the output voice of the voice
10 synthesizer 217 are multiplexed by the multiplexing unit 218 as the left channel and the right channel, respectively. The resultant is transmitted to a voice recording and reproducing unit 219.

During interpretation services, the voice output of the
15 voice multiplexing unit 218 is automatically recorded by the voice recording and reproducing unit 219 ~~at~~by a command from the control unit 210, and is stored user by user. The voices stored in the voice recording and reproducing unit 219 are reproduced by a command from the control unit 210 when the
20 voice input and output unit 222 detects that predetermined dial numbers are pressed from the interpreter terminal. The reproduced voices are transmitted to each terminal via the voice synthesis unit 224 of the detected terminal.

Consequently, if the user terminals have a voice
25 demultiplexing function, the voices of the respective

terminals during interpretation services can be checked in the language of the interpretee on the left channel and in the language of his/her conversation partner on the right channel.

~~Incidentally, users~~Users can also reproduce and check the

5 voices stored in the voice recording and reproducing unit 219 ~~afterward~~at a later time by calling the interpretation center and inputting a predetermined access code from their terminals.

~~Incidentally, the~~ The method of synthesizing the voices to be recorded into the voice recording and reproducing

10 unit is not limited to the foregoing ~~one~~. Any kind of method may be used as long as the users can check the details of the interpretation services. Since some user terminals do not ~~have~~ include the voice demultiplexing function, the output voice of the voice synthesizer 216 and the output voice of the voice
15 synthesizer 217 may be recorded separately. In this case, either one of the voices designated from a terminal can be reproduced for transmission.

The users may include persons other than those who have received the interpretation services. The voices stored in the
20 voice recording and reproducing unit 219 may also be reproduced and transmitted when access-authorized persons call the interpretation center by using their telephone terminals and the input predetermined access code.

The foregoing preferred embodiments ~~have dealt with the~~
25 ~~eases where~~ has a configuration in which the interpretee

terminal and the interpreter terminal(s) preferably use
ordinary telephone terminals (especially cellular phones) to
be connected to public telephone lines. ~~Nevertheless~~However,
the present invention is not limited thereto. The present
5 invention may also be applied to the cases ~~where~~in which
dedicated telephone terminals to be connected to dedicated
lines are used, and ~~where~~in which IP (Internet Protocol) type
telephone terminals to be connected to Internet lines are used.
Even in these cases, similar telephone interpretation systems
10 or similar telephone interpretation methods ~~can be achieved~~are
obtained to provide the effects and advantages of the present
invention.

Moreover, the present invention may be ~~applied~~used to
~~the function of transmitting and receiving~~transmit and
15 receive voices in interpretation services that use videophone
sets having an image and voice communication function. In this
case, the interpretee and his/her conversation partner can see
the images of the interpreters, and the interpreters can see
the images of the interpretee and his or her conversation
20 partner. This facilitates ~~grasping~~understanding of the details
of the interpretation, ~~allowing the provision of~~which enables
quicker and more precise interpretation services.

~~INDUSTRIAL APPLICABILITY~~

25 As has been described, preferred embodiments of the

present invention ~~provides the effect that in~~ provide
telephone interpretation when persons who speak different
languages meet each other, the interpreter(s) can interpret
the speech of a speaker in progress simultaneously without
5 interrupting the speech of the speaker or mixing up the
conversation, thereby ~~allowing~~ enabling quick and precise
interpretation.